

## ABSTRACT

An armored gamma detector, mining system, and methods of use are described. The gamma detector includes a scintillation element, a window, and a photo-metric module, including a photomultiplier tube and a logic element. The photo-metric module and window are encased within an explosion-proof housing. The scintillation element is encased within a housing having at least one window which may be made of a material including polyether ethyl ketone. The logic element is adapted to determine the amount of gamma radiation detected over a predetermined time period, as well as a running average of the amount of gamma radiation detected over the time period. In one embodiment, a pair of gamma detectors may be used in tandem to determine the position of the cutting drum of the mining equipment relative to the boundary between the ore vein being cut through and adjacent rock strata.

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